REMARKS

Reconsideration of this application as amended is requested. By this amendment Applicant has amended the specification at page 2 to substitute the issued patent number for the original application serial number; has amended claims 1 and 2; and has added new claims 3-7. Claims 1-7 are now in the case.

The Examiner objected to claim 2 because of an informality – "providing" step should be "processing" step in line 1. Applicant thanks the Examiner for pointing out the error and has amended claim 2 accordingly, rendering the Examiner's objection moot.

The Examiner rejected claim 1 under 35 U.S.C. 102(b) as being anticipated by Lubin et al ("Lubin"), and claim 2 under 35 U.S.C. 103(a) as being unpatentable further in view of Brill et al ("Brill"). Applicant respectfully traverses these rejections by the Examiner.

Applicant's claimed invention adds to basic spatial human vision system (HVS) modeling a temporal dimension, i.e., "temporally processing the reference and test image signals prior to the spatial modeling", to account for a shift in peak sensitivity and for frequency doubling and other subtleties in a spatio-temporal sensitivity function by emulating neural attack and decay. The temporal processing is performed by having a linear temporal filter having characteristics of a combination of a low-pass and bandpass filter to account for the subtleties in the spatio-temporal sensitivity function followed by a non-linear temporal filter having characteristics of an envelope follower having a faster attack than decay to account for the shift in peak sensitivity and for frequency doubling in the spatio-temporal sensitivity function. The

linear temporal filter has a series of field delay modules with a tap at each field with the taps coupled to respective multipliers for weighting by respective coefficients. The outputs from the multipliers are summed to produce the weighted difference between frames of the input signal with each frame having an appropriate decay for the older of the two fields that makeup the frame. The non-linear temporal filter compares a decayed version of its output with the linear temporal filter output to produce a comparison output that is multiplied by an attack function before being rectified. The rectified output is added to the decayed version to produce the non-linear temporal filter output. The attack and decay functions are determined by calibrating the HVS model to both a spatio-temporal threshold surface and corresponding supra-threshold regions of a spatial frequency doubling illusion.

In contradistinction to Applicant's claimed invention Lubin discloses linear temporal filtering that provides as outputs both a low-pass temporal response and a band-pass temporal response, i.e., separates the luminance component of each input sequence into two different channels – a sustained channel and a transient channel. The sustained channel blurs the input signal temporally, but provides relatively good spatial resolution, while the transient channel blurs the input signal spatially, but provides good temporal resolution to detect motion or color changes in the input signal. However the temporal filtering of Lubin does not account for a shift in peak sensitivity and for frequency doubling as Lubin does not emulate neural attack and decay -- a non-linear function.

Applicant has amended claim 1 to more clearly state the purpose of the temporal filtering to differentiate the temporal processing of the present invention from that of Lubin. Applicant does not provide dual channel outputs from the

temporal processing for input to the spatial processing stage as required by Lubin. Thus claim 1 as amended is deemed to be allowable as being neither anticipated nor rendered obvious to one of ordinary skill in the art by Lubin.

Applicant has amended claim 2 to be consistent with claim 1 as well as correcting the error noted by the Examiner as discussed above. In contradistinction to Applicant's invention as recited in claim 2 Brill discloses in more detail the linear temporal filtering of Lubin, which produces a temporal low-pass response on one path and a temporal high-pass response on another path. The temporal low-pass response is formed by multiplying the input signal by a constant and a prior image frame by another constant and then adding them together to produce a temporal averaging effect. The temporal high-pass response is formed by subtracting two products, one being based on the input signal and the other being based on a two-frame prior image. The band-pass filter output is obtained by taking the difference of two low-pass filters. This neither teaches nor suggests the combination of a linear temporal filter in series with a non-linear temporal filter as recited in claim 2. Nor does it teach or suggest the accounting for a shift in peak sensitivity and for frequency doubling in a spatio-temporal function by emulating neural attack and decay as recited in claim 1. Thus claims 1 and 2 are deemed to be allowable as being nonobvious to one of ordinary skill in the art over Lubin in view of Brill.

Applicant has added new claims 3-7 to recite additional details about the respective linear and non-linear temporal filtering steps. These claims also are deemed to be allowable as depending upon claims deemed to be allowable and as being nonobvious to one of ordinary skill in the art over Lubin in view of Brill.

In view of the foregoing amendment and remarks allowance of claims 1-7 is urged, and such action and the issuance of this case are requested.

Respectfully submitted,

KEVIN M. FERGUSON

By Francis I. Gray
Francis I. Gray
Reg. No. 27,788
Attorney for Applicant

TEKTRONIX, INC.
P. O. Box 500, MS 50-LAW
Beaverton, Oregon 97077
(503) 627-7261

7055 US